



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/875,296	06/07/2001	Ryoichi Yamamoto	W-2723 (07250001AA)	4660
30743	7590	09/03/2004	EXAMINER	
WHITHAM, CURTIS & CHRISTOFFERSON, P.C. 11491 SUNSET HILLS ROAD SUITE 340 RESTON, VA 20190			BROOKE, MICHAEL S	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 09/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/875,296	<b>Applicant(s)</b> YAMAMOTO ET AL.	
	<b>Examiner</b> Michael S. Brooke	<b>Art Unit</b> 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 9-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 9-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1, 2, 4, 9, 10, 12, 16 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Usui et al. (6,074,040).**

With respect to claims 1 and 9, Usui teaches (Fig. 14) an ink jet printer having a head body including: a plurality of orifices (71) in an array, a substrate (2) having a plurality of ink ejection units (91), each of which corresponds to an orifice, a plurality of flow paths (81), each of which supplies ink to an orifice, a common flow path (83) that extends across the head and that has a portion extending through the substrate (8 and 9) and a metal nozzle plate (7) formed on the upper surface of the barrier layer (19) (col. 4:19-25). A nozzle plate (7) has a nickel film with a thickness of 0.2 microns formed thereon (col. 12:65-67, claims 2 and 24). This metal film has a limited thickness.

With respect to claims 2, 4 10 and 12, a nozzle plate (7) has a nickel film with a thickness of 0.2 microns formed thereon.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 3, 9, 11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's Admitted Prior Art (AAPA) in view of Nagahata et al. (5,335,002).**

The AAPA teaches an ink jet print head for a printer comprising a head body (150) having a plurality of orifices (20) that extend substantially across the head, a plurality of ejection units (see p. 2:15) corresponding to each orifice, a plurality of individual flow paths formed by partition walls (15) and a least one common ink flow path (16) that extends substantially across the head. An ink supply bore hole (18) is bored on a side opposite the orifices and supplies ink to the at least one common flow path. As can be seen in Fig. 8, the thickness of the head body is substantially equal to the thickness of the wafer that formed the head body. The substrate would be substantially inflexible, as silicon is a substantially inflexible element. Furthermore, it is clear that the substrate has sufficient thickness to include the various claimed head structures.

The AAPA teaches the claimed invention with the exception of a metal film at least on a part of at least one side of the head body.

Art Unit: 2853

Nagahata et al teaches (Fig. 6) a substrate (2) for a print head that has a metal reinforcing layer (18) that is formed on the underside of the substrate. This reinforcing layer has a limited thickness. The metal reinforcing layer functions both as a heat sink and to strengthen the substrate against breakage (col. 8:44-48). Nagahata further teaches the reinforcing layer may be used in any type of printing head (col. 4:23-25).

It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made to have provided the AAPA with a metal film at least on a part of at least one side of the head body in order to strengthen the substrate, as taught by Nagahata. Furthermore, it would have been obvious to one of ordinary skill in the ink jet art to pattern the reinforcing layer to allow for ink inlets or any other openings that are required for the operation of the print head.

**Claims 2, 4,10, 12, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Nagahata et al. (5,335,002), as applied to claims 1, 3, 9, 11 and 12 above, and further in view of Gaynes et al. (6,197,619).**

The AAPA, as modified teaches the claimed invention with the exception of the layer being made of Ni and the layer having a thickness of 0.1 microns to 0.9 microns.

Gaynes et al. teaches a method of reinforcing a semiconductor device by applying a Ni layer (107) having a thickness of 0.1 microns to 4 microns (col. 3:23-29), which is thinner than the thickness of the substrate (105). Providing

Art Unit: 2853

such a layer prevents cracking due to warping or mechanical loading by reinforcing the surface of the device (col.1:56-60). Gaynes further teaches the equivalence of nickel and aluminum for the purpose of forming a semiconductor substrate reinforcing layer.

It would have been obvious to one of ordinary skill in the ink jet art at the time the invention was made to have provided the AAPA, as modified, with a Ni film having a thickness of 0.1 to 0.9 microns for the purpose of reinforcing the device to prevent cracking due to warping or mechanical loading, as taught by Gaynes et al.

### ***Response to Arguments***

Applicant's arguments filed 06/15/04 have been fully considered but they are not persuasive.

Applicant's amendment has overcome the rejection under Hock.

The Applicant's argument that Usui does not teach a metal layer is not persuasive. The Applicant alleges that the metal layer Usui reacts with sulfur to form a single covalently bonded layer; thus destroying the metal layer and forming a single sulfur compound layer. The Examiner disagrees with this characterization of Usui. Usui teaches that the sulfur compound adsorbs to the gold layer (col. 7:30-39). Thus, the gold layer is not destroyed, but rather, the sulfur compound binds to the surface of the gold layer. Furthermore, the Ni layer, which is the layer relevant to this discussion, does not react with the sulfur compound. The Ni layer serves to increase the bond strength between the gold

Art Unit: 2853

lay and the nozzle member. Therefore, the Ni layer is not illusory, but exists as a physical entity on the nozzle plate. Accordingly, the claimed limitations are met.

In response to applicant's argument that Usui fails to recognize the problem addressed by the present invention, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

The Applicant's argument that the Examiner's statement that the admitted prior art "teaches the claimed invention with the exception of a metal film on a part of at least one side of the head body" is an overstatement of the prior art is not persuasive. The admitted prior art teaches the structure, just as described by the Examiner. That the admitted prior art does not address the need for a metal layer is not seen to be relevant, as this is why 35 USC 103(a) exists. The question is whether it would be obvious to add such a layer to the admitted prior art.

The Applicant's argument that Nagahata failed to teach the claimed metal layer is not persuasive. The Applicant argues that since the metal layer of Nagahata also functions as a heat sink, then the layer is too thick to achieve Applicant's purpose. This line of reasoning is incorrect. The question is not whether the metal layer can achieve the Applicant purpose, but whether there is motivation to modify the admitted prior art. Clearly, such motivation exists. Nagahata teaches the metal layer reinforces the substrate, which is relatively

Art Unit: 2853

brittle (col. 8:44-48). The Applicant has not explained why this motivation is not a valid reason for coming Nagahata with the admitted prior art. With regard to the thickness of the metal layer of Nagahata, the reference makes no mention of any particular thickness. The Applicant has not submitted any evidence that a heat sink/support layer could not be a thin film. In fact, the Examiner has provided Alderstien, which teaches a semiconductor structure that has a heat sink layer (30) that is 1 micron thick (col. 4:44-46). Furthermore, assuming arguendo, that the metal film of Nagahata was too thick, Gaynes teaches a reinforcing layer having the claimed thickness, while Nagahata teaches the use of such a reinforcing layer in a print head.

In response to applicant's argument that Gaynes fails to recognize the problem addressed by the present invention, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In this case, Gaynes teaches a metal reinforcement layer having the same structure, as the claimed invention.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is



Art Unit: 2853

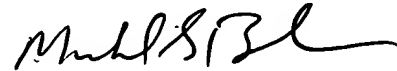
filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael S. Brooke whose telephone number is (571) 272-2142. The examiner can normally be reached on M-F from 5:30 AM-2:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2853

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael S. Brooke  
Primary Examiner  
Art Unit 2853

MSB  
08/04/04